

REACTIVE GATE ELECTRODE CONDUCTIVE BARRIER

ABSTRACT OF THE INVENTION

5 A method, and corresponding transistor structure are
provided for protecting the gate electrode from an underlying gate
insulator. The method comprises: forming a gate insulator overlying a
channel region; forming a first metal barrier overlying the gate insulator,
having a thickness of less than 5 nanometers (nm); forming a second
10 metal gate electrode overlying the first metal barrier, having a thickness
of greater than 10 nm; and, establishing a gate electrode work function
exclusively responsive to the second metal. The second metal gate
electrode can be one of the following materials: elementary metals such as
p+ poly, n+ poly, Ta, W, Re, RuO₂, Pt, Ti, Hf, Zr, Cu, V, Ir, Ni, Mn, Co,
15 NbO, Pd, Mo, TaSiN, and Nb, and binary metals such as WN, TaN, and
TiN. The first metal barrier can be a binary metal, such as TaN, TiN, or
WN.